



Division of Agricultural Sciences
UNIVERSITY OF CALIFORNIA

TRENDS AND OUTLOOK

California & United States

MEAT PACKING INDUSTRY



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THE CALIFORNIA MEAT-PACKING INDUSTRY

... faces a very favorable market for meat and meat products. It will experience the same difficulty as all other packers, however, in disposing of inedible by-products. Major difficulty appears to lie in its adjustment to projected changes in the livestock and feedlot industry of the state. If these changes occur, the Rocky Mountain states may become the major supplier of meat for the California market. The future position of California packers appears to hinge on the changing location of livestock supply, feed, and feeding areas.

This circular was prepared from a much more detailed report, "Changes in the Meat Packing Industry in California and the United States," by Allen B. Richards and Peggy J. Biaggi. That complete report, plus a statistical supplement, is available on microfilm.

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The data for this study were obtained from secondary sources, including U. S. Department of Agriculture publications, trade publications, and all other available sources of material pertaining to the meat industry. A complete list of references will be found in the microfilmed report.

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CALIFORNIA AND THE UNITED STATES MEAT-PACKING INDUSTRY TRENDS AND OUTLOOK

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THE MEAT-PACKING INDUSTRY in the United States has grown from the Colonial period, when "packing" consisted of preserving meat, for sailing vessels, in barrels of brine or salt, to a national industry of over 3,000 slaughtering plants owned by numerous packers. The industry has gone through three distinct stages: first, it was small, with widely dispersed local plants; then it became highly centralized in the hands of a few national packers; and in the 1920's, it began to decentralize, and this process continues today.

Following the Revolutionary War, the industry began to move westward. By the time of the Civil War, Chicago had become an important packing center. The possibility of preserving meat by refrigeration opened new areas of expansion. Shipping meat, rather than livestock, from the midwest to the eastern states became feasible. Between 1880 and 1900, large packers built plants in such centers as Kansas City, Wichita, St. Joseph, Omaha, and Sioux City. As companies merged, and smaller slaughterers dropped out, the number of packing establishments dropped from 1,118 in 1890 to 921 in 1900.

After World War I, the move toward decentralization was accelerated by increased use of trucks, better roads, and advantageous direct buying.

During World War II, the number of independent wholesale packers, especially in the southern, mountain, and western regions, increased rapidly, with a corresponding decrease in small butchering

Table 1. Change in Concentration of Slaughter, 1947-1955

Species	"Big Four"	5th 10th largest
	per cent	
Cattle.....	-19.6	+34.0
Calves.....	-12.4	+ 3.6
Sheep and lambs.....	- 9.9	+45.2
Hogs.....	-13.7	+ 6.4

Source: Williams, Willard F., "Structural Changes in the Meat Wholesaling Industry," *Journal of Farm Economics* 40 (1): 320. May, 1958.

establishments and a somewhat static situation in the major firms.

The development of chain stores within the past 20 years has also affected the packing industry. Chain stores reportedly sell close to 40 per cent of the total retail meat supplied by packers. Use of the federal meat grades in advertising has contributed significantly to the independent packer's ability to compete with national "home-brand" packers.

The nine national packers, ranked by the 1958 value of sales, are: Swift, Armour, Wilson, Hygrade Food Products, John Morrell, Cudahy, George A. Hormel, Rath Packing Company, and Oscar Mayer, with Swift, Armour, Wilson, and Cudahy known as the "Big Four." Table I shows that the relative slaughter percentage has steadily declined for the Big Four, and increased for the fifth to tenth largest firms.

Recently, independent packers have tended to specialize in slaughter of only one species. As of March, 1955, 20.6 per cent of United States packers followed this trend.

Development of the California Industry

Before the Gold Rush, little slaughtering was done in California except for

fresh meat, hides, and tallow. In 1856, the slaughtering firm of Miller and Lux was started in San Francisco which, by 1880, became an established meat-packing center. In 1881 the Miller and Lux firm slaughtered 83,332 animals.

Another large-scale rancher, William Dunphy, had 40,000 acres in Nevada and 20,000 at Monterey. He shipped cattle from Nevada either to his Monterey ranch, for finishing on better grass, or to his slaughterhouse in San Francisco, which had a 1,000-head per month capacity in 1882.

In 1880, Merry, Faull and Company filled a contract with Russian Siberia for 4,500 barrels of mess beef. Other firms packing, slaughtering, and selling some carcasses in San Francisco included Michelssen, Brown and Company; the South San Francisco Packing Company; Red Cross Packing; and J. Y. Wilson and Company.

In 1900, San Francisco was still the leading packing center in California, accounting for 26 of the 58 packing houses in the state, and 59 per cent of the capital invested. By 1925, however, it was surpassed by Los Angeles. By 1929, meat packing was the fourth leading industry of California, in value of products, which had risen from \$5 million in 1899 to \$116 million in 1925.

Modern meat-packing establishments in California began in 1931, with the state's compulsory meat inspection law. This service, started in 1917, had at first been voluntary, for packers who wished to pay for it. When it became compulsory, many small local butchers, who slaughtered only a few animals per week, could not afford the construction changes needed for compliance with the law, and as a result, ceased operation. Remaining California companies under this rigid inspection adapted easily to the federal inspection law (the Fulmer Act) passed during World War II. This law required all packing houses shipping meat in interstate commerce to be federally inspected.

The decentralization trend was not so noticeable in California as nationally because interior packers were already well established in the state. In recent years, however, the trend has become more pronounced. The closing of the terminal yards at San Francisco preceded either the closing or the movement of several packers to the interior. Only James Allan and Sons and William Taaffe and Company are left in "Butchertown" and Swift and Company in South San Francisco. In 1960, with the closing of the Los Angeles terminal yards, Stockton was left as the only terminal market. Los Angeles, however, is still the undisputed packing center of the state.

What is a Packing Company?

In common usage, the term "packing company" is applied to the slaughtering firm, the processing firm, and the slaughtering-and-processing firm. In the meat industry, however, only the slaughtering and slaughtering-and-processing firms are called meat packers, as distinguished from meat processors. The latter do no slaughtering, but buy meats at wholesale, for further processing and sale to retail and institutional trade. Meat processors include sausage makers, canners, boners,

and makers of frozen meat specialty portions.

National packers are those slaughter-processor firms that have national distribution of their product, and annual sales of over \$100 million. Regional packers have annual sales between \$15 and \$100 million. Sectional packers' annual sales are between \$3 and \$15 million. Local packers distribute products in the immediate area, slaughter between 300,000 and 2 million pounds per year, and have less than \$3 million in annual sales.

Butchers and frozen food-locker companies that slaughter less than 300,000 pounds annually are not usually included as meat packers. Wholesale packers are federally inspected, and/or slaughter more than 2 million pounds annually. Individual packers not connected with national or regional packers are termed independent wholesale packers.

The functions of the packer are: (1) to slaughter the livestock; (2) to dress, cure, process, and can the meat; (3) to convert or dispose of by-products; (4) to store perishable and nonperishable meat products; and (5) to distribute meat and meat products, including jobbing and operation of branch houses and warehouses.

Not all meat-packing plants are alike. They operate according to location and the dictates of profit. Almost one third of the plants in the United States kills and processes all three species—cattle, sheep, and hogs. A few in the southwest slaughter goats. In the corn belt many packers specialize in pork, some selling only carcasses, others including boning in the operation, and several using part or all of the pork for making sausage. Throughout the country, other plants specialize in beef. Not many specialize in sheep and lambs except for a few on the west coast. Plants also vary according to whether the firm has its own distributing trucks and livestock buyers, and the number of kill beds, or lines.

MEAT CONSUMPTION

The demand for individual meats and by-products changes constantly, but meat, as such, remains the most important single item in the food budget.

United States

Beef and pork, the two major types of meat consumed, are competitive. In the

past seven years, beef consumption has surpassed that of pork, which had led for many years. Veal consumption and supply often reflect the cattle production cycles; when cattlemen are building up their herds they keep their calves. Per capita consumption of veal was at an all-time low of 5.7 pounds in 1959. Lamb and mutton consumption, high during

Table 2. Use of Meat per Person, Farm and Nonfarm Household,
One Week in Spring 1955, by Regions

Region and household group	All meat	Beef	Veal	Lamb and mutton	Pork	Variety meat	Lunch-eon meats	Lard
	pounds							
United States:								
All	3.02	1.25	0.08	0.09	1.14	0.10	0.36	....
Urban	3.17	1.34	0.10	0.12	1.13	0.11	0.36	0.07
Rural nonfarm	2.80	1.10	0.05	0.03	1.15	0.08	0.39	0.18
Farm	2.82	1.18	0.02	0.02	1.21	0.07	0.32	0.39
Northeast:								
All	3.07	1.29	0.12	0.19	0.98	0.13	0.37	....
Urban	3.10	1.29	0.15	0.23	0.95	0.14	0.35	0.02
Rural nonfarm	2.92	1.23	0.06	0.09	1.01	0.10	0.43	0.07
Farm	3.30	1.54	0.05	0.07	1.15	0.09	0.39	0.18
North Central:								
All	3.37	1.51	0.07	0.05	1.23	0.09	0.42	....
Urban	3.42	1.52	0.10	0.08	1.22	0.09	0.42	0.04
Rural nonfarm	3.17	1.43	0.05	0.01	1.17	0.08	0.43	0.11
Farm	3.45	1.61	0.02	0.01	1.34	0.06	0.40	0.27
South:								
All	2.57	0.85	0.04	0.02	1.26	0.09	0.30	....
Urban	2.93	1.09	0.06	0.03	1.33	0.12	0.30	0.16
Rural nonfarm	2.32	0.64	0.03	0.02	1.22	0.06	0.34	0.32
Farm	2.18	0.68	0.01	0.01	1.18	0.06	0.23	0.56
West:								
All	3.31	1.62	0.07	0.13	1.00	0.11	0.37	....
Urban	3.25	1.52	0.07	0.17	1.00	0.12	0.38	0.04
Rural nonfarm	3.58	1.89	0.12	0.04	1.05	0.09	0.38	0.08
Farm	3.15	1.73	0.03	0.10	0.89	0.08	0.31	0.12

Source: Breimyer, Harold F. and Charlotte A. Kause, "Consumption Patterns for Meat," in Household Food Consumption Survey, 1955 Rpt. no. 5. Washington, D. C., U. S. Govt. Printing Office, 1956, p. 11.

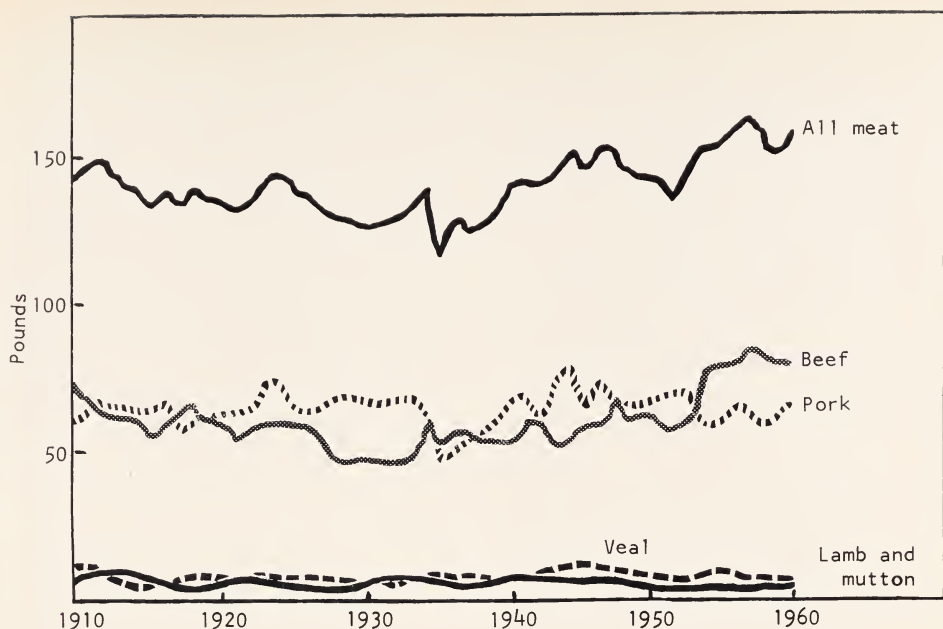


FIG. 1. MEAT CONSUMED PER CAPITA, UNITED STATES, 1910-1960. (Source: "Meat Consumption Trends and Patterns," U.S. Department of Agriculture, Agriculture Handbook No. 187, Washington, D.C., 1960.)

the 1930's and World War II, has decreased to a fairly constant 4 pounds per capita over the past 10 years.

Table 2 shows use of meat per person for 6,000 households, in the United States as a whole, and in the four geographical areas, during one week in the spring of 1955.

The western states ranked second to the north coast states in total meat consumption according to the 1955 survey (see table 2). Annual per capita meat consumption in the west was estimated at 170 pounds in 1960. Figure 1 shows per capita consumption in the United States.

California

No figures are available on meat consumption in California. Those given are based on available national and regional estimates. The 1960 estimate for the western region as a whole was 170 pounds per capita. California consumption was quite likely somewhat higher. On that

basis, California consumed about 2.7 billion pounds of meat in 1960.

California's annual per capita consumption of beef has been unofficially estimated at 100 pounds. Consumer preference for beef varies. Los Angeles can absorb about 5 per cent Prime beef (although this figure is probably declining), 35 per cent Choice, 20 per cent Good, 15 per cent Standard and Commercial, and 25 per cent Utility. In 1954, Los Angeles apparently used about 45 per cent steer, 23 per cent heifer, and 32 per cent cow carcasses of weights up to 800 pounds. San Francisco preferred less Prime and Choice, and more Utility carcasses. The Chinese section of the city usually absorbs the cow carcasses and the Standard and Commercial grades. Oakland also sells much cow beef. Sacramento, while selling some cow beef, absorbs about 35 per cent Choice.

Lamb consumption in California is high. New York and California together

consume almost half the lamb produced in the United States (41.8 per cent in 1954). In 1954 the Pacific Coast states led in per capita consumption of lamb and mutton, with California consumption estimated at 12.3 pounds. The per capita consumption in 1955 was estimated at about 6.8 pounds for the west.

Pork consumption for the western region was 52 pounds per capita in 1955—a figure below the national average (62.1). California's consumption probably lies somewhere between the national and regional figures.

Consumption Trends

Changes in population and changes in per capita consumption of meat, as influenced by consumer preference and income, determine the outlook for the meat industry.

Conservative estimates expect the United States population to reach 220 million by 1975 and possibly 272.5 million or over by 1980.

A population projection for California, made in 1958 by the State Department of Finance, forecasts 28.5 million inhabitants by 1980—an 80 per cent increase over the 1960 figure.

Changes within the total population are also significant in attempting to show possible future trends in consumption. In the United States it is expected that the number of consumers in the heavy meat-eating age group (14 to 24) will increase in coming years, and at a greater rate than that of other age groups. However, in the next five years, it is possible that per capita meat consumption may not continue to increase at the present rate because: the bulk of the male labor force (ages 25 to 44) will remain fairly constant; the number of working women is increasing; fewer people over 65 will be in the work force; younger persons will have longer schooling; and part-time employment will increase. These factors all have an adverse effect upon consumption.

After 1965, on the other hand, the population composition and the characteristics of the labor force suggest a marked increase in consumption of meats of all kinds. By 1975, per capita consumption may reach 175 pounds.

Consumption of different types and varieties of meats will vary. Beef is expected to continue to outdistance all other types. By 1958–1959 the proportion of disposable income spent on beef was back to the levels immediately following World War II. As incomes rise, beef consumption will rise proportionately more than that of other meats. Also, consumer interest in lean meats is likely to continue.

In addition to the better performance expected for beef than for pork, lamb, or veal, is the expected shift to convenience meats—frozen, precut, precooked, prepared meats, variety and luncheon meats, as well as canned products. However, it is unlikely that the demand for convenience meats will increase faster than that for other types.

California Consumption

The prospective expansion in the meat-consuming public is even greater for California than for the United States as a whole. The state's population increase is predicted to be considerably above the national growth rate, and has been much faster, in the young age groups, than any region. The number of people under 14 grew by 72 per cent between 1950 and 1958. The other two age groups in California have grown less rapidly, but still faster than for the United States and most of the individual regions.

California is likely to grow at a greater rate than any other western state. Population characteristics and their changes will have opposing influences on per capita consumption of meat. On the one hand, a rapid rise in number of persons above 65 and below 14 will tend to

decrease per capita consumption. The groups will tend to lower the total expenditures for meat by consuming less and by influencing the purchase of lower-priced cuts and types. Offsetting this, however, is the substantial growth forecast for the total population in the state and the higher than national average growth of the labor force. In addition, the shift from farm to nonfarm status will continue. On a net basis, the market for meat in California is expected to increase as a result of the population growth and changes. California constitutes the largest market in the west, and is likely to grow in importance between now and 1980.

Assuming, as a conservative estimate, that California experiences exactly the same rate of growth as the United States in per capita meat consumption in the next 20 years, it can be expected to reach about 179 to 196 pounds in 1965, and 191 to 209 pounds by 1975. Total con-

sumption is expected to range from 3.4 to 3.7 billion pounds in 1965 and 4.8 to 5.3 billion pounds in 1975. The latter is an increase of 96 to 112 per cent over 1956. In view of the differences between the state's growth and consumer preferences and those of the country as a whole, it is likely that California's per capita consumption will increase faster.

Income

Personal disposable income in the United States has increased, but the percentage of that income spent for meat has declined from 5.5 in 1950 to 4.8 in 1959. However, from 1950 to 1959, the percentage of income spent on beef has increased, while that spent on pork has declined substantially—25 per cent (table 3).

Per capita income in the United States increased 38 per cent between 1950 and 1958, but for California the increase was

Table 3. Retail Value of Meat Consumed, as a Percentage of Disposable Personal Income, 1935-1939 Average and 1946-1959*

Year	Total meat†	Beef	Pork
	per cent		
1935-39 average.....	5.7	2.2	2.8
1946.....	4.6	1.6	2.4
1947.....	6.3	2.6	3.1
1948.....	6.1	2.6	2.8
1949.....	5.6	2.5	2.6
1950.....	5.5	2.5	2.4
1951.....	5.5	2.5	2.5
1952.....	5.4	2.5	2.4
1953.....	5.1	2.3	2.2
1954.....	5.0	2.3	2.2
1955.....	4.7	2.3	2.0
1956.....	4.5	2.2	1.8
1957.....	4.6	2.4	1.8
1958.....	5.0	2.6	1.9
1959‡.....	4.8	2.6	1.8

* Retail value is computed by multiplying by retail prices the fresh retail-cut equivalents of beef, veal, lamb and mutton, and pork consumed. It includes the value of home-produced meat as well as all meat sold.

† Beef, veal, lamb and mutton, and pork.

‡ Preliminary.

Source: The National Food Situation, NFS-93, Washington, D. C., U.S.D.A., July, 1960.

slower—35 per cent. However, in 1950 California's per capita income was 20 per cent above the national average, and in 1959 it was 23 per cent above. California's personal disposable income in 1959 was 10.4 per cent of the national total.

These rising incomes and relative rates of growth are important with respect to future consumption patterns. The effect of income changes on the quantity of meat consumed can be measured by the income elasticity of demand. This is the per cent of increase in quantity of meat consumed that results from a 1 per cent increase in real income—income after price changes are taken into account. Recent estimates indicate that a 1 per cent increase in real income results in a percentage increase in consumption of all meat of 0.35; of beef, 0.4; of pork, 0.25; and of lamb, 0.6. As real income rises, consumers tend to buy better quality meats, rather than larger quantities. Thus producers and marketers might gain by providing top quality products to meet the rising consumer demand.

Trends in income, particularly in California, indicate that packers may expect increased consumption of higher-priced convenience-type meats.

Prices

Meat prices were at their low in 1956, when per capita consumption was at a record high. Lower relative prices since then, however, have not induced consumers to eat more meat. In fact, per capita consumption since 1956 has been well below the 167 pounds recorded for that year. It is likely that, as livestock numbers continue to grow, they will have a dampening effect on meat prices. Also, red meats will be subject to continued price competition from other food products, particularly poultry, eggs, and dairy products. Price elasticities of demand show the influence of prices on meat consumption by indicating the changes in consumption associated with a 1 per cent change in retail price. Estimates for all meats range from -0.82 to -0.24 . This means that a 1 per cent change in the price of all meats is associated with a 0.24 to 0.82 per cent change in the *opposite direction* in quantity of meat consumed. For beef, estimates of price elasticities have an even wider range from -0.75 to -0.96 . Therefore, other things being equal, lower relative prices will result in a less than proportionate increase in meat consumption.

MOVEMENT AND PROCUREMENT OF LIVESTOCK

Feeder cattle are produced in several parts of the country, transported to feed areas, then moved to slaughter markets and/or packers. Sheep and lambs have similar marketing patterns. Hogs, however, do not move so much as other livestock since they are generally produced and fed in the same area—notably the corn belt. Thus, packers must procure their livestock from many sources and types of markets.

Cattle

Within the last 10 years, in certain parts of the country, an important step in the marketing of cattle and, to a lesser extent, lambs, has been the development of the large commercial feedlot. Before these became so numerous, most of the feeder stock was either shipped to the corn belt for feeding or was fed on meadows, good ranges, or irrigated pas-

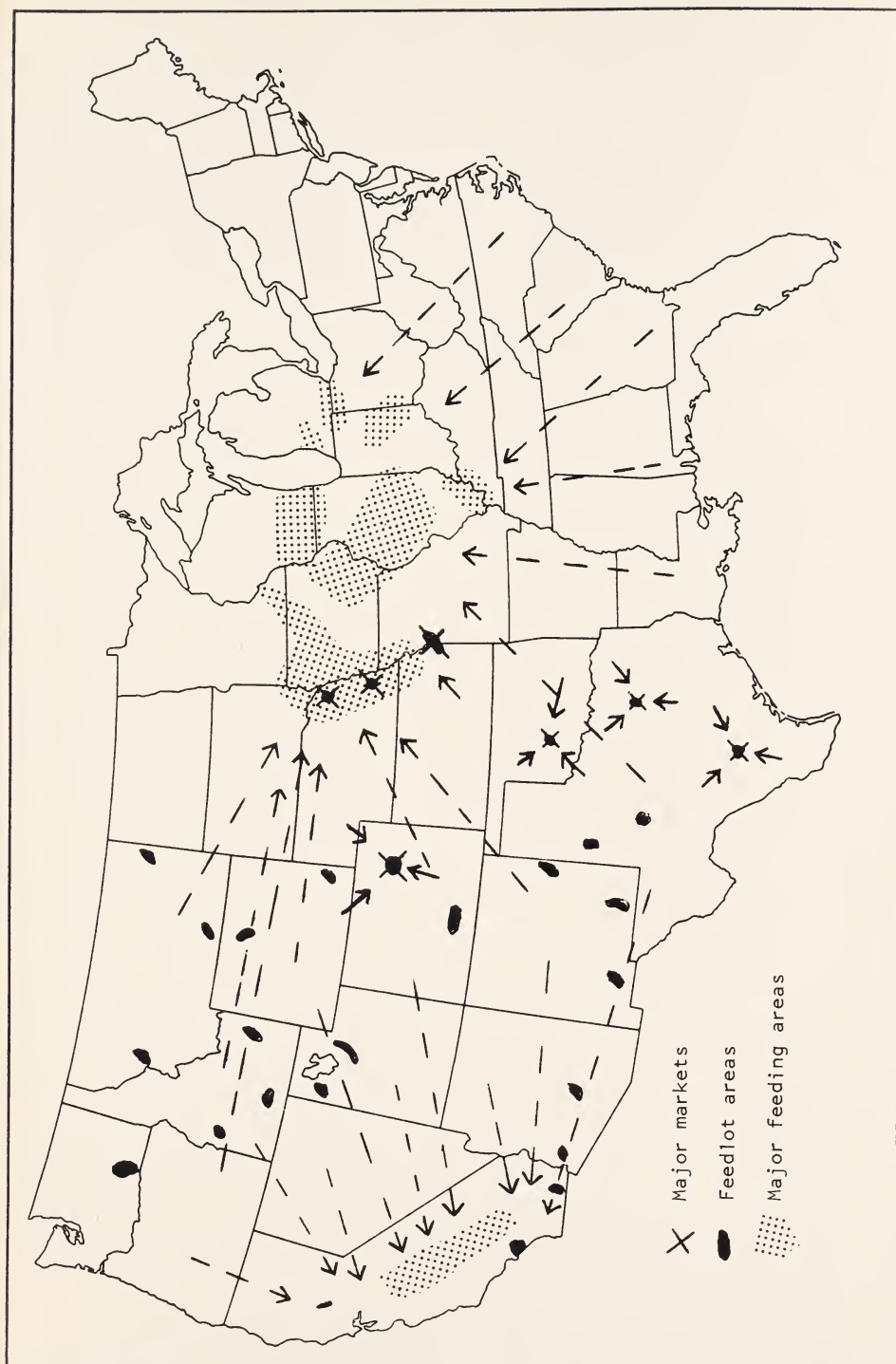


FIG. 2. MOVEMENT OF STOCKER AND FEEDER CATTLE TO MAJOR MARKETS AND FEEDING AREAS.

tures, to "grass fat" slaughter animals. Today, the trend is to slaughter grain-fed steers, although grass-fat animals are still slaughtered in areas where grain feeding is not economically feasible.

The main feeding areas are the corn belt; the sugar beet areas of Nebraska, Wyoming, Idaho, Colorado, and California; and, lately, some sorghum-growing areas in the southwest (fig. 2).

Stocker and feeder cattle move through many different channels and often pass through many hands before reaching the packer. In some areas, farmer and rancher use of terminal marketing facilities has declined, whereas their use of auction markets and order buyers has increased.

In general, there are two movements of stockers and feeders—to the corn belt area, and to California feedlots (arrows, fig. 2). Some feeders do move into other western feedlot areas, but except for Colorado, movement is less pronounced.

In 1959, Texas shipped almost as many stockers and feeders to California as to the corn-belt states. Arizona, Oregon, and Nevada shipped over 100,000 feeders into California. Most of the Texas shipments go to Kern, Imperial, or Los Angeles counties. About three fifths of the cattle on feed are in Kern and the eight southern California counties.

Lambs

While a few calves, particularly in Oklahoma, Texas, and the southern states, are slaughtered directly off the cow (weaners), most go on to range and/or into the feedlot. Lamb producers, however, hope to obtain a high percentage of "milk-fat" lambs for slaughter directly off the ewes. The percentage of such lambs and of feeders within a band varies with annual feed conditions and with areas.

The areas of lamb feeding are slightly more dispersed than those of cattle. The middle west, Colorado, and California are the three main ones.

California and Arizona generally have the first spring milk-fat lambs on the market, after (and sometimes before) the old croppers are marketed. In California the first milk-fat lambs are moved from the San Joaquin bands, which, in favorable years, produce a high percentage of fats. They are then marketed from the Sacramento Valley area, Petaluma and Sonoma, Mendocino County, and the Humboldt-Siskiyou area, in that order, generally with some overlapping.

About 60 per cent of the lambs slaughtered in California are shipped in from other states—40 per cent feeders and 60 per cent slaughter lambs. Utah, Idaho, Nevada, and Montana shipped the most stocker and feeder lambs into California in 1959. Idaho, Utah, and Oregon shipped most of the slaughter animals.

Many of the California feeder lambs, and those shipped before or during July, are generally fattened on irrigated pastures in the Dixon area or the central Sacramento-San Joaquin Valley. Most of the feeders shipped in the fall go to Imperial Valley for fattening on alfalfa. The main lamb market yard is at Dixon since the closing of the South San Francisco stockyards.

Recently, the importing of sheep and lambs from Australia and Canada has alarmed many western lamb breeders and feeders. Between 1958 and 1959 these imports nearly doubled. All the Australian lambs arrive by ship at San Diego or San Francisco. The arrival of 20,000 to 25,000 lambs in a single shipment has been held by many to be a price depresser since the animals are generally sold for slaughter after a 30-day quarantine, and usually slightly under the market price for California lambs.

California Markets

Only one union stockyard, at Stockton, now operates in California, but there are several individual auctions and com-

mission firms. The larger markets include the Producers Livestock Marketing Association in Artesia, which opened after the Los Angeles Union Stockyards closed; the Valley Livestock Marketing Association auctions at Dixon and Red Bluff; and the California Farm Bureau Marketing Association in Visalia. Of these markets, Los Angeles usually has the larger number of salable receipts for cattle, calves, and hogs. It also has the largest local slaughter of cattle and calves, while South San Francisco has the largest local slaughter of hogs, sheep, and lambs.

Sources of Livestock Bought by Packers

Meat packers buy livestock from several sources, depending on geographic location, size of plant, and availability of supply. These sources are: terminal stockyards or public markets; auctions or local markets; dealers or order buyers; direct (from farmers); commercial feedlots—particularly on the west coast; and others. Generally, in the west, about two thirds of slaughter animals are bought directly either by packer buyers or through order buyers. In other parts of the country, the terminal or public market plus the auctions accounts for the larger percentage. The fact that California has only one terminal market (Stockton) necessitates more buying from commercial feedlots and direct from producers. This is especially true in the buying of beef steers and heifers.

About the same pattern is followed for sheep and lambs except that, in the western states, most of the lambs are bought direct instead of from feedlots. However, in the Bay Area, a few packers buy some lambs from commercial feedlots. Since

the terminal market in San Francisco closed, auctions such as the one in Dixon have probably become more important as sources of slaughter lambs.

About 34 to 40 per cent of the hogs slaughtered by packers are bought at terminal markets except in southern California, where the figure is closer to 75 per cent. Very few slaughter hogs in California are bought at auctions.

The northeastern states and California are the two main areas in which packers must obtain some of their livestock from outside the state. In the northeast, the local plants buy their stock within the region, but the federally-inspected plants ship in practically all their hogs, sheep, and higher-grading cattle.

In California, most of the higher-grade slaughter cattle are from California feedlots, with about one fifth of the beef steers and heifers coming from the other western states. Partly because of the state's dairy industry, the packers in northern California receive most of the lower-grading cattle and calves from within the state. In southern California, however, about 18 per cent of the veal comes from outside the western states, mainly from the midwestern states and Texas.

In 1955-1956, California producers and feeders supplied almost three fourths of the sheep and lambs killed in northern California, and two thirds of those killed in the south. The remaining lambs slaughtered by the state's packers are shipped in from the other western states. Northern California ships in 69 per cent of its hogs, and southern California, 91 per cent. It is significant that the hog carcasses and cuts bought from the midwest by Bay Area packers account for 12 per cent of the packers' total sales of pork.

LIVESTOCK SLAUGHTER

Output in the meat-packing industry, which is influenced by cyclical and seasonal variations, has been increasing in recent years.

United States

Total live-weight slaughter of cattle, calves, hogs, sheep, and lambs in the United States has increased 8.7 billion pounds in the last 10 years. Total commercial slaughter in 1959 was 45.7 billion pounds.

Slaughter of cattle within the past 10 years has increased by about 6.1 billion pounds. The general trend for the slaughter of calves under federal inspection has been downward between 1958 and 1960, although a few regions increased the number slightly. The cycles of hog production are becoming slightly shorter. Hog numbers will probably always be adjusted more rapidly than beef numbers since the periods of gestation and growth to market or maturity are considerably shorter. Slaughter of sheep and lambs has varied little over the past 10 years.

California

On January 1, 1960, record livestock inventories were listed in California. Numbers of dairy cattle, beef cattle, and stock sheep on farms were greater than recorded in previous years.

The all-time high of 4,274,000 cattle and calves in California was composed of 61 per cent beef cattle and 39 per cent dairy stock. The 1960 number of cattle and calves was about one fourth higher than the 10-year average. Significantly, the cow and heifer numbers were up 7 and 8 per cent, respectively, from 1959. The counties having the largest number of cattle and calves (minus milk cows two years and older) on January 1, 1960, were Kern, Imperial, Fresno, and Tulare. These counties, near the southern

end of the state, have a milder climate, nearby markets, readily available feed supply, and consequently more large cattle feedlots.

Stock sheep increased 7 per cent between 1959 and 1960 in spite of adverse prices and range conditions. Most of the stock sheep are located in the coast range counties of Sonoma (leading with about 143,000 sheep and lambs), Glenn, Mendocino, Kern, and Solano.

The number of hogs in California has gradually declined since World War II. In 1960 there were only 417,000 pigs in California, one thousand more than in 1959. Garbage feeding establishments made up 43 per cent of the hog inventory. The percentage of garbage-fed pigs has generally been lower, however, since the law was passed requiring garbage to be cooked.

California produced about 3 per cent of the nation's live weight of cattle, calves, hogs, sheep and lambs. As expected, the state accounted for 0.5 per cent of the national hog production, but produced 4 and 6 per cent, respectively, of cattle and sheep.

Recent projections of California livestock numbers to 1975 indicate that sheep production will decline about 10 per cent, and hog production about 50 per cent, both absolutely and relative to United States production. Beef cattle production is projected to remain at about present levels (table 4). The beef cattle industry (particularly feedlot finishing) appears particularly vulnerable with respect to feed grain supplies. Projected feed grain supplies in the state are not sufficient to meet projected consumption by dairy cattle, poultry, and other livestock. Since dairy and poultry production is likely to outcompete other livestock uses, feed requirements for this group will be met first. Dairy, poultry, hogs, and sheep production together is

Table 4. Projected 1975 California Beef Cattle, Hog, and Sheep and Lamb Production with 1954-1957 Comparison

Animal	1954 1957	1975
	number of head	
Beef cattle:		
Beef cows, 2 years +	839,250	850,000*
Cattle fed in feedlots	1,272,250	1,333,000*
Heifer replacements, 1-2 yrs.†	167,850	170,000
Calves (yearling replacements)	697,000	702,000
Steers, 1 + wintered	138,000	122,000
Bulls‡	33,570	34,000
Hogs: total pigs saved (spring + winter)	549,250	300,000
Sheep and lambs:		
Ewes, 1 year +§	1,393,500	1,220,000
Lambs fed (early)§	1,119,000	948,000
Ewe lamb replacements||	278,700	244,000
Other sheep	200,050	190,000

* 1975 projection equal to 1955-1958 average for California.

† Assumes 20 per cent replacement rate of beef cows, 2 years and over.

‡ Assumes 1 bull per 25 beef cows, 2 years and over.

§ 1975 projection based on a 10 per cent decline from 1949-1958 average levels.

|| Assumes a 20 per hundredweight replacement rate for ewes, 1 year and over.

Source: Dean, Gerald W. and Chester O. McCorkle, Jr., "Projections Relating to California Agriculture in 1975," California Agr. Exp. Sta., Giannini Foundation Rept. No. 234 (mimeo.), July, 1960, pp. 42-54.

estimated to consume almost all of the 1975 projected feed grain production. Thus, to maintain present feedlot production, essentially all of the feed grains and over 50 per cent of the feeder cattle required would have to come from outside the state.

On the basis of these projections, the outlook for the feedlot industry of the state does not appear bright, even with sufficient grain imported to feed out cattle originating in California.

A decline in the California feedlot industry is likely to result in a decline in the packing industry. If cattle can be fattened out-of-state cheaper than in California, it is likely that these cattle will be slaughtered in the same locale. This naturally depends on relative transport and slaughter costs between California and other areas.

In 1950 California accounted for 6

per cent of the national livestock slaughter, and by 1959, 7 per cent.

Cattle. Between 1950 and 1957 California was the leading state in the slaughter of cattle, and was a close second to Iowa in 1958 and 1959. California cattle slaughter increased 5 per cent between 1958 and 1959.

During the last two years (1958-1959), about 40 per cent of the cattle slaughtered was in northern California, and 60 per cent in southern California. The San Francisco Bay Area, as noted previously, has declined within recent years in the number of cattle slaughtered. For the first seven months of 1960 the Bay Area slaughtered around 26 per cent of the northern California total, as compared with 30 per cent in 1959 and a 34 per cent average for 1955-1959. Of the total state cattle slaughter, the Bay Area accounted for 10 per cent for the

Table 5. Commercial Slaughter for California by Total Live Weight, 1950-1959

Year	Cattle		Calves		Hogs		Sheep and lambs	
	1,000 lb.	Per cent of U.S.	1,000 lb.	Per cent of U.S.	1,000 lb.	Per cent of U.S.	1,000 lb.	Per cent of U.S.
1950.....	1,513,098	8.8	96,409	4.7	478,046	2.9	172,381	14.1
1951.....	1,676,665	10.6	81,839	4.7	542,574	3.0	168,395	15.6
1952.....	1,817,021	10.6	100,809	5.2	543,946	3.0	185,693	13.7
1953.....	2,206,363	10.0	148,533	5.7	433,371	2.8	204,998	13.6
1954.....	2,252,511	9.7	150,386	5.4	436,317	2.8	217,717	14.4
1955.....	2,415,814	10.0	153,861	5.7	517,754	2.9	233,212	15.0
1956.....	2,580,499	10.0	161,265	5.8	539,660	3.0	228,561	15.0
1957.....	2,425,247	9.7	141,771	5.5	435,833	2.6	230,523	16.0
1958.....	2,188,866	9.4	110,172	5.6	399,651	2.4	217,286	15.6
1959.....	2,307,833	9.9	89,674	5.5	425,978	2.2	247,847	16.6

Source: U. S. Department of Agriculture, Livestock and Meat Statistics 1957, and Supplements 1958 and 1959, Stat. Bul. 230, and California State Department of Agriculture, "Annual Report of Bureau of Meat Inspection," California Department of Agriculture Annual Reports for years of study.

first seven months of 1960, as compared with 12 per cent in 1959 and a 13 per cent average for 1955-1959.

At the other end of the state, Los Angeles County slaughtered 82 per cent of the southern California total in 1954-1958 and 85 per cent in 1959 and during the first seven months of 1960. Of the total state cattle slaughter, Los Angeles County alone accounted for 50 per cent in 1954-1958, 51 per cent in 1959, and 52 per cent from January to July in 1960.

Calves. California ranked fourth in the slaughter of calves on a live-weight basis, in 1959, and fifth in the number of calves. Calf slaughter varied from 4.7 per cent of the United States total in 1950 to 5.8 per cent in 1956, and dropped to 5.5 per cent in 1959 (table 5).

In 1959, the plants in northern California slaughtered 53 per cent of the California total. The Bay Area accounted for only 8 per cent of the state slaughter in 1959—a drop from the 14 per cent of 1954-1958. Between 1954 and 1960, Los Angeles County accounted for about 40 per cent of the California calf slaughter (85 to 90 per cent of the southern California total).

Sheep and lambs. For several years California ranked first among the states in the slaughter of sheep and lambs. From 1958 to 1959 slaughter was increased by 30,561 pounds live weight (14 per cent). In the peak slaughter year of 1959 California produced 16.6 per cent of the national sheep and lamb slaughter.

About one half of the sheep and lambs is slaughtered in northern California, almost 24 per cent in the Bay Area. Forty-seven per cent is slaughtered in Los Angeles County. While slaughter in the Bay Area has declined in recent years, that in Los Angeles has increased slightly. It now has close to 95 per cent of the southern California sheep and lamb slaughter.

Hogs. Ever since World War II and the decline in California hog numbers, the state has imported far more hogs than it produces.

As expected, hog slaughter in California has varied by 144 million pounds between the high and low slaughter marks in the past 10 years. Over-all, the state's hog slaughter averaged around 2.9 per cent of the national total from 1950 to 1956, but dropped to 2.2 per cent in 1959.

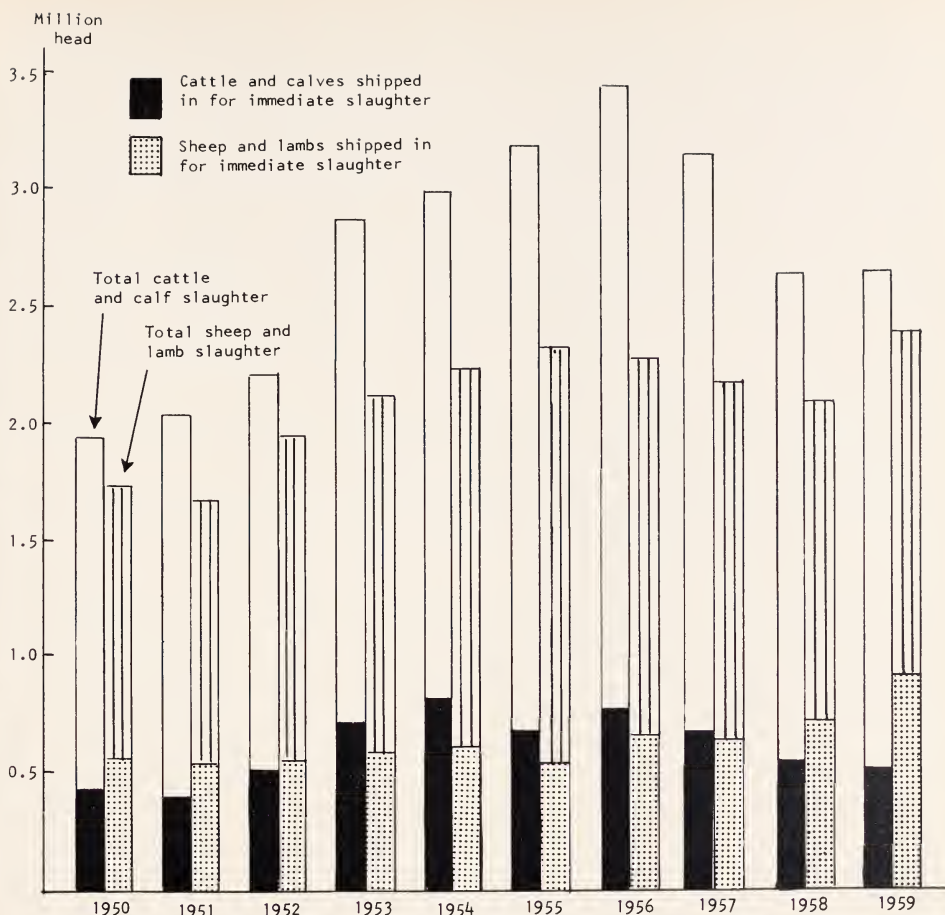


FIG. 3. NUMBER OF CATTLE, CALVES, SHEEP AND LAMBS SLAUGHTERED COMMERCIALY IN CALIFORNIA AND NUMBER SHIPPED INTO CALIFORNIA FOR IMMEDIATE SLAUGHTER, 1950-1959.

Roughly 60 per cent of the hogs is slaughtered in Los Angeles County, as compared with 20 per cent in the Bay Area. The ratio between northern and southern California in hogs killed is about 3 to 7.

Average weight of slaughter animals. The average live weight of cattle slaughtered in California was 1,046 pounds in 1959, as compared with 1,014 pounds for the country as a whole. During the past 10 years, California live weight has generally averaged about 50 pounds heavier per animal than the national average. Between 1950 and 1954 the average weight of the calves slaughtered in Cali-

fornia was above the national average; since 1954 it has been below. In 1959 the average calf slaughtered weighed 196 pounds in California, which is downward from previous years.

Hogs have varied very little in average weight per head slaughtered since 1950. The 10-year average (1950-1960) is 232 pounds. California's slaughter lambs are generally 4 or 5 pounds heavier than the national average.

Estimated uninspected slaughter. Each year the California Bureau of Meat Inspection estimates the amount slaughtered in the state that is not under federal or state inspection. This includes

Table 6. Estimated Uninspected Slaughter* in California, by Number of Head

Year	Cattle	Calves	Sheep	Swine	Total
1950.....	29,000	49,000	80,000	89,000	247,000
1951.....	29,000	49,000	80,000	89,000	247,000
1952.....	29,000	49,000	80,000	89,000	247,000
1953.....	29,000	49,000	80,000	89,000	247,000
1954.....	29,000	49,000	80,000	89,000	247,000
1955.....	29,000	49,000	70,000	89,000	237,000
1956.....	29,000	49,000	70,000	85,000	233,000
1957.....	n.a.†	n.a.†	n.a.†	n.a.†	180,000
1958.....	19,000	30,000	53,000	65,000	167,000

* Includes (1) animals slaughtered in uninspected slaughtering establishments located in counties of less than 28,000 population, (2) animals slaughtered in counties over 28,000 population but under inspection exemption, and (3) animals slaughtered on farms.

† Not available.

Source: U. S. Department of Agriculture, Livestock and Meat Statistics 1957, and Supplements 1958 and 1959, Stat. Bul. 230, and California State Department of Agriculture, "Annual Report of Bureau of Meat Inspection," California Department of Agriculture Annual Reports for years of study.

farm slaughter, animals slaughtered in uninspected establishments in counties of less than 28,000 population, and animals slaughtered in establishments in counties of more than 28,000, but exempt from inspection. At present only two establishments are exempt from state inspection. In 1958, 167,000 animals were slaughtered uninspected—19,000 cattle, 30,000 calves, 53,000 sheep, and 65,000 swine (table 6). From 1950 to 1958 the number of animals slaughtered uninspected dropped by 80,000.

Inshipments of cattle and calves for im-

mediate slaughter have generally increased parallel to the total California slaughter increase, as sheep and lamb inshipments have followed the general sheep and lamb slaughter trend. The inshipment trend does not follow the slaughter trend exactly; the peak year of cattle and calf inshipments was 1954, whereas the peak slaughter year was 1956. In sheep, both the slaughter numbers and number of inshipments for immediate slaughter followed essentially the same trend, with the peak years coinciding in 1959 (fig. 3).

MEAT DISTRIBUTION

In recent years substantial changes have occurred in the meat distribution system. These developments have resulted in a new environment in which packers must market their products.

Meat is usually distributed to retail outlets; hotels, restaurants, and institutions; jobbers and wholesalers, including packer branch houses, boners, and truck distributors; meat processors; and government agencies, including military.

The distribution of sales to various outlets in the northeast and California are shown in table 7. With a few exceptions, around half of the dressed meat went to retailers and most of the remaining meat went to jobbers and wholesalers. In 1955, 6 to 7 per cent of California's dressed beef went to the government. Inland northern California packers sold 73 per cent of their dressed beef to

jobbers and wholesalers, and 40 per cent of their veal to meat processors. Over half the fresh pork in southern California went to meat processors. Around 5 per cent of the lamb slaughtered by northern California packers was purchased by the government.

Effects of Chain Stores

The most dynamic trend in meat distribution has been the growth of the supermarket and chain store. Grocery stores selling over \$1,000 a day accounted for 70 per cent of total grocery

Table 7. Percentage of Total Sales Made by Packers in the Northeastern Region and California,* by Type of Sales Outfit, 1955

Meat and area	Type of sales outlet						
	Retail	Hotels, restaurants, institutions	Jobbers and wholesalers	Meat processors	Government	Consumers	Other
	Per cent						
Beef:							
Northeast.....	38.0	5.0	37.0	12.0	1.0	2.0	5.0
Bay Area packers...	59.0	0.7	31.3	2.6	6.4	....	....
Other northern							
Calif. packers....	18.9	0.1	73.1	0.5	7.4	....	....
Total N. Calif.....	42.8	0.5	48.2	1.7	6.8	....	....
Southern Calif.†...	56.6	0.2	31.3	4.8	7.1	....	....
Veal:							
Northeast.....	44.4	1.3	34.9	14.1	0.1	1.5	3.7
Bay Area packers...	24.8	0.1	67.8	6.8	0.5	....	....
Other northern							
Calif. packers....	3.5	‡	55.2	40.1	1.2	....	....
Southern Calif.†...	59.8	0.0	33.2	4.0	3.0	....	....
Pork:							
Northeast.....	48.5	10.5	13.2	8.7	7.7	0.8	10.6
Northern Calif.....	53.3	0.9	41.1	2.0	2.7	....	....
Southern Calif.†							
Fresh.....	26.6	0.9	11.7	58.9	1.9	....	....
Cured.....	75.6	1.9	18.5	0.1	3.9	....	....
Lamb:							
Northeast.....	61.6	0.5	32.5	0.1	0.0	0.8	4.3
Bay Area packers...	60.2	0.2	32.2	1.2	6.2	....	....
Other northern							
Calif. packers....	59.9	‡	34.7	0.1	5.3	....	....
Southern Calif.†...	72.5	0.4	22.3	4.3	0.5	....	....

* Distribution of sales only within the Bay Area and Los Angeles County.

† 1956.

‡ Less than 0.05 per cent.

Sources: Dietrich, Raymond A. and Willard F. Williams, "Meat Distribution in the Los Angeles Area," Washington, D.C., U. S. Department of Agriculture Marketing Res. Rept. 347, 1959, p. 15; McIntosh, Kenneth D., "Characteristics of Livestock Plants in Northeastern United States," Morgantown, West Virginia Agr. Exp. Sta. Bul. 428, 1959; Williams, Willard F., "Wholesale Distribution in the San Francisco Bay Area," Washington, D.C., U. S. Department of Agriculture Marketing Res. Rept. 165, 1957, pp. 20, 34, 46.

store sales in 1958. Chains with 11 or more stores accounted for 37 per cent of total food sales in the United States in 1958, and for 44 per cent in California. Chains with two or more stores accounted for 66 per cent of total food sales in California in 1958.

Grocery store numbers dropped 9 per cent between 1954 and 1958 in the United States, but dropped only 7 per cent in California. The size and sales of stores have increased while the number of stores has decreased.

In California it is estimated that 90 per cent or more of the grocery stores have a fresh-meat department, compared with the national estimate of 75 per cent or more. Around 25 per cent of the total food sales in United States chain stores is accounted for by the meat departments. Roughly, chain store meat sales are distributed as follows: one third, beef; one fifth, poultry; one eighth, lunch meat and sausage; one tenth, pork; and the remainder, veal, lamb, and cured meats.

Chain stores helped to promote two related meat marketing conditions of importance to the packer—graded meat and specification buying. The first was regarded by the chain store as an easy way to advertise meat and to get the consumer to associate grades with a standardized quality. Through the adoption of federally-graded meat by numerous packers, the chain stores have more sources of uniform-quality meat and avoid dependence on a few packers. Specification buying is usually done by phone, with the purchaser specifying the quantity, grade, carcass weight, type, dress, trim, carcass age, delivery, and other factors. Although chain stores use only packer grades and government grades when buying fresh beef and lamb, a third grade or private label is used by some of the stores in selling meat.

Wholesale Meat Structure

Most wholesalers transfer meat from the packer to the retailer, processor, and government agency. Only a fraction of the total meat is distributed by the wholesaler; the remainder goes directly from the packer to the retailing medium. In the Bay Area (1955), the amount of direct shipments by area packers and packers outside the area was 44.8 per cent. Sixty-five per cent of the meat available in Los Angeles County in 1956 came directly from packers.

The wholesale structure consists of packer branch houses and independent jobbers, including hotel and restaurant supply houses, purveyors, wholesalers, breakers, boners, truck distributors, calf handlers, and frozen-meat handlers. Wholesalers and breakers concentrate on buying, breaking into wholesale cuts, and distributing beef carcasses. Most of their sales are to chains and independent retailers. Boners take carcasses or carcass cuts, remove bone and sinew, and sell to processing and government agencies. Truck distributors, more prominent in the Los Angeles area, usually operate with no fixed place of business, and handle a small volume of meat daily. Most of their sales are to independent retailers. Calf handlers are jobbers who specialize in distributing veal and calf carcasses and cuts. This practice seems to prevail mainly in the Bay Area, where 52.1 per cent of the veal is distributed by calf handlers. Most of the frozen-meat handlers are still relatively small-volume firms buying carcass or boned meat to process into chip steaks, veal patties, and quick-frozen cuts.

The outstanding trend in the wholesale industry has been the reduction of the number of packer branch houses and their diminishing portion of total wholesaler meat sales. In the United States

between 1954 and 1958 the number of independent meat wholesaler establishments increased 2.3 per cent while the number of other meat wholesale establishments (including mostly packer branch houses and agents and brokers) decreased 6.9 per cent. Likewise, aggregate sales of packer branch houses, agents, and brokers have decreased while aggregate sales of independent meat wholesalers have increased.

The number of meat-wholesaling establishments in California accounted for 9.1 per cent of the United States total in 1958—an increase of only 1 per cent over 1948. Sales, however, amounted to 8.7 per cent of the 1958 United States total, as compared with 5.7 per cent in 1948. The number of independent wholesale establishments and their aggregate sales in California have increased considerably faster than the national average. The number of packer branch houses in California has decreased slightly while sales have increased.

In the Los Angeles-Long Beach and San Francisco-Oakland standard metropolitan areas the number of packer branch houses has decreased slightly, especially in the Bay Area. Percentage increases in the growth of independent wholesalers have not been so large in those two metropolitan areas as in other areas of the state.

Packer branch houses in the Bay Area distributed close to 40 per cent of the total pounds of meat distributed through wholesale channels. Two thirds of this meat was in the form of fresh and cured pork. Of the independent wholesalers, jobbers handled more of the fresh meat, particularly beef, than did the other types of independent wholesalers. In the Los Angeles area, however, the packer branch houses handle only 24 per cent of the meat distributed through wholesale channels. As in the Bay Area, most of

the meat sold by branch houses is mainly fresh and cured pork.

The distribution of federal grades varies with type of packer or wholesaler and the location.

In California, Choice beef is the dominant grade, for little Prime beef is sold. Good grade beef is normally the second largest category except with packer branch houses, wholesalers, and jobbers who handle Standard or lower as the second largest category. Most of the veal handled falls into the Good grade, whereas most of the lamb handled is Choice and Prime.

Three main aspects of grading affect all but the national packer. First, grading has been a selling aid to both independent packers and wholesalers. It has increased the number of sales over the telephone, thereby reducing merchandising costs, especially for packers far from the retailing market. Price quotations can be reported more accurately by the U. S. Department of Agriculture, and therefore are available to the packer and wholesalers for fairly uniform-quality grades. Second, grading is a buying aid for independent wholesalers. Third, grading is a means by which independent packers and wholesalers may compete more satisfactorily with national packers and packer branch houses. Through the years, the national packers have cultivated a consumer preference for their brand names. With the advent of widespread federal grading and mass advertising of the federal grades by the chain stores, the independent packer and wholesaler are also able to sell a quality product that is well known. Some national packers have had to adjust business operations because of federal grading. The main complaint of national packers against federal grading was that grades restrict the packer's ability to sell beef to its best advantage.

In addition to the animal carcass or processed cuts from it, the packer obtains other materials that will eventually be processed into many commodities, such as hides and skins, edible and inedible fats, animal feeds, wool, animal hair, glue and gelatin, pharmaceuticals, and edible by-products. An average 1,000-pound steer will yield about the following amounts (pounds) in by-products: hide (green), 78; fats for edible tallow, 40; variety meats, 37.5; glands, 2; blood, 27.5; miscellaneous items for inedible tallow and tankage, 83.

Pelts and Hides

The most valuable by-product of a slaughter animal is its hide or skin. A hide is defined as being removed from full-grown cattle, and weighing 30 pounds or more. Kips are cattle hides weighing 15 to 30 pounds. Calf skins weigh 15 pounds or under. There are three main classes of hides: cows, steers, and bulls. Under these are the subclasses: Colorado (side-branded); native (unbranded); and Texas steer (branded as Colorado, but must also be of close-coupled pattern and plumb, with relatively little mud or manure).

Big-packer hides usually command higher prices because they ordinarily have fewer knife scars, and are separated according to the classes listed above. Small packers, except in associations, rarely have enough hides to make separate packs. Hides from the locker-butcher, renderer, and farmer are known as "country hides," and bring lower prices, in the order listed. Some individual operations classified as small packers or countries do, by care and by use of electric skinning knives, produce quality hides.

The general trend for the last 20 years has been a gradual increase in number

of cattle hides produced, with the peak in 1956, and a slight decline since then (table 8). Calfskin, showing no definite trend for the same period, had two highs, one during the later years of World War II, and one from about 1954 to 1956. Production of sheepskin appears to be declining since the record slaughters of World War II. And only 1 per cent of the national hog slaughter is estimated to be skinned. At present only one tannery takes pig-skin exclusively, for fine leather items, luggage, brief cases, and so forth.

Hides and skins are normally marketed through three channels. A large tannery may buy direct from a national packer who sorts packs; small packers may sell green hides to renderers who cure them; or, most commonly now, hides and skins are handled by hide dealers and brokers. An estimated 80 per cent of the hides moving to tanners in 1958 was handled by the latter method. Many collector-dealers have curing facilities, and purchase hides green from locker-butchers, small packers, and renderers.

Inedible Tallow and Grease

Production of inedible animal fats is not limited to meat packers. In 1957, 61.4 per cent of the inedible fats in the United States was produced by renderers, and 33.1 per cent by packers.

With the increase of detergents, the main outlet for inedible tallow and grease—soap making—has changed to exports. The more important by-products exported from the United States (in terms of dollars) are inedible tallows and greases, which go mainly to Italy, Japan, and the Netherlands.

The second largest domestic outlet for these by-products from 1956 through 1958 was in prepared mixed animal

Table 8. Estimated United States Production of Hides and Skins*

Year	Cattle	Calves	Sheep and lambs
	1,000 head		
1940.....	16,355	11,081	28,285
1941.....	17,880	11,370	29,678
1942.....	19,593	12,067	32,568
1943.....	19,579	12,500	34,729
1944.....	21,578	17,014	32,406
1945.....	21,694	16,335	30,547
1946.....	21,373	14,723	28,196
1947.....	23,868	16,192	23,627
1948.....	20,565	14,625	22,223
1949.....	20,272	13,731	18,497
1950.....	20,059	12,798	17,519
1951.....	18,621	11,228	15,636
1952.....	20,228	11,819	18,573
1953.....	26,038	14,687	20,593
1954.....	27,463	15,759	20,362
1955.....	28,163	15,298	20,762
1956.....	29,213	15,386	20,593
1957.....	28,482	14,701	19,548
1958.....	25,864	12,016	18,792
1959.....	25,237	10,426	19,942

* Derived from total slaughter plus deaths.

Source: U. S. Department of Agriculture, Livestock and Meat Statistics, 1958, and Supplements 1958, 1959. Stat. Bul. 230.

feeds. (Meat meal, tankage, blood meal, and bone meal are also used in animal feeds.) Fats constituted 0.8 per cent of the feed manufactured in 1956. Those fats were made up of the following percentages: tallow, 73; grease, 19; soapstock and foots, 2; other fats and oils, 6. This potentially large outlet for tallow and grease will remain so, however, only if the price of tallow remains competitive with other sources of energy. The price has fallen from 18.8 cents per pound, received by renderers in 1947, to 7.4 in 1954. It is quite likely that prices will remain low in coming years, with the rising livestock population and the forecast increase in animal slaughter.

Lard

The three main uses for lard are: (1) the direct domestic market (households,

bakeries, restaurants and institutions), 68 per cent; (2) exports, 18 to 25 per cent; (3) for the manufacture of shortening and margarine, about 14 per cent. (Figures are for 1958.)

Lard was usually rendered, processed, and packaged in 1-pound packages at the slaughtering level. Now, many of the small packers find it more economical to sell the lard in drums or in bulk, to the wholesaler, who does the processing and packaging.

Trend for By-products

With substitute materials making inroads into the markets for animal by-products, meat packers are likely to find it difficult to dispose of these products. Packers will also be less able to depend on by-products for profit margins. Even if scientific discoveries bring about new

uses, packers will have to depend more heavily than in the past on meat produc-

tion and distribution as the principal source of net income.

INDUSTRY STRUCTURE

The number of slaughtering plants in the United States has dropped from 3,238 in 1950 to 3,144 in 1960 (table 9). These were plants slaughtering over 300,000 pounds, live weight, annually. Although the total number of plants has declined, the number under federal inspection (fig. 4) has increased in every section of the country and in all but 15 states. The number of processing plants has also increased.

United States Regions

New England is declining as a slaughter area. Between 1955 and 1959 there was a 15 per cent decline in livestock production, a 20 per cent decline in the number of slaughter plants, and a 27 per cent decline in slaughter. In 1959, the slaughter of cattle and calves represented over 60 per cent of total slaughter and over 75 per cent of total production. However, most of these were dairy cattle.

The middle Atlantic region is also a declining slaughter area, and is likely to continue so. Like New England, this region produces mainly dairy cattle and calves. Since the region must import most of the slaughter animals that provide fresh quality meat, and has little prospect of increasing livestock production substantially, its future as a slaughtering area depends upon relative transport costs for livestock and meat, and slaughter costs in other regions as compared with these states. Slaughter in federally-inspected plants accounts for most of the beef steers and heifers slaughtered in these states. Pennsylvania accounted for more than one half of the hog slaughter, and New Jersey slaughtered over one half of the sheep and lambs in the region.

The east north central region is second only to the west north central area in total slaughter. The number of plants in the region declined between 1955 and 1959, but the average slaughter per plant rose. Illinois and Wisconsin had the largest slaughter per plant in the region in both 1955 and 1959. In general, the area is characterized by packer movement away from terminal markets to country points, and a consolidation and refurbishment of plants.

The number of packing plants in the west north central region increased between 1955 and 1959, largely in Kansas. The number of plants declined in Minnesota and North and South Dakota. The region contains the largest plants, on the average, in the nation. In both 1955 and 1959, average slaughter per plant was well above that of other regions. Iowa led the nation in slaughter per plant in both years. Both Iowa and South Dakota experienced a substantial increase in slaughter per plant between 1955 and 1959. This region should continue to remain a major slaughter area, although there is some question whether the number of plants will continue to increase.

The Delaware-Maryland section is the only livestock deficit area within the south Atlantic region. The other states produced more livestock in 1955 and 1959 than they slaughtered. Although hogs are the major slaughter animal, in 1955 more cattle were slaughtered than hogs. In 1959, Virginia had the largest slaughter in the region, with Georgia second.

Texas, with over one third of the plants, slaughters most of the lambs in the south central region. Tennessee, Kentucky, and Texas account for more than

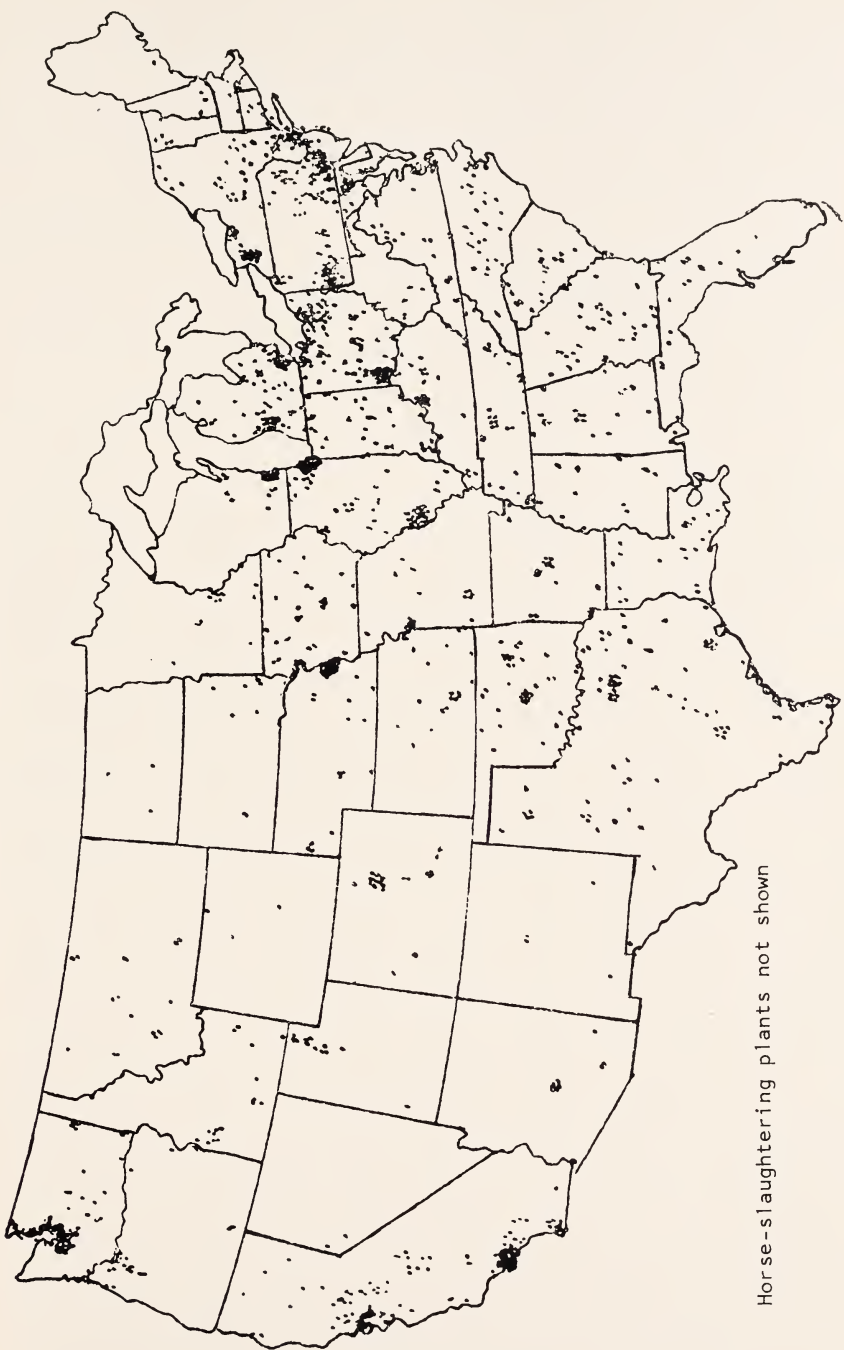


FIG. 4. ALL FEDERALLY-INSPECTED AND LARGE, NONFEDERALLY-INSPECTED LIVESTOCK SLAUGHTERING PLANTS, MARCH 1, 1960.

one half of the total slaughter of hogs. The region in general is one of surplus livestock production. In both 1955 and 1959, all states in the region except Tennessee produced more livestock than they slaughtered. The future of the packing industry in this region as well as the

whole south depends heavily on prospective location of livestock production. If the south continues to grow in the direction of more livestock, home-located slaughter is likely to grow with it. However, it is as likely that southern industrialization may induce southern packers

Table 9. Number of Slaughtering Establishments

State†	Under federal inspection		Other commercial‡				Total establishments	
			Large		Medium			
	1955	1960	1955	1960	1955	1960	1955	1960
New England	19	14	18	13	55	46	92	73
Middle Atlantic:								
New York	23	30	36	29	80	65	139	124
New Jersey	17	17	10	8	36	31	63	56
Pennsylvania	21	26	87	92	217	228	325	346
Total	61	73	133	129	333	324	527	526
East North Central:								
Ohio	29	32	83	81	133	125	245	238
Indiana	14	13	33	23	89	87	136	123
Illinois	32	39	30	22	73	49	135	110
Michigan	4	4	82	87	113	103	199	194
Wisconsin	17	19	30	12	12	26	59	57
Total	96	107	258	225	420	390	774	722
West North Central:								
Minnesota	10	12	9	2	24	17	43	31
Iowa	21	27	7	9	21	15	49	51
Missouri	13	17	26	23	20	24	59	64
North Dakota	2	..	2	3	7	7	11	10
South Dakota	6	7	2	3	9	5	17	15
Nebraska	18	29	11	7	21	22	50	58
Kansas	16	16	12	12	33	55	61	83
Total	86	108	69	59	135	145	290	312
South Atlantic:								
Delaware-Maryland	11	10	17	16	39	22	67	48
Virginia	9	12	12	11	25	19	46	42
West Virginia . . . . .	..	..	12	13	20	25	32	38
North Carolina	2	3	33	29	65	55	100	87
South Carolina	1	5	11	13	34	32	46	50
Georgia	7	5	33	38	48	56	88	99
Florida	4	6	26	19	36	29	66	54
Total	34	41	144	139	267	238	445	418

to obtain livestock from other areas, thus tending to reduce the need for local plants. Texas, Oklahoma, and Florida are likely to experience greater growth in slaughtering than are the other states in the region.

The substantial increase in the num-

ber of plants in the mountain region was due to increases in only four states—Idaho, Colorado, New Mexico, and Arizona. Montana remained unchanged, while numbers in the other states declined. Idaho experienced a 62 per cent growth in number of plants from 1955

ishments,* March 1955 and 1960

State†	Under federal inspection		Other commercial‡				Total establishments	
			Large		Medium			
	1955	1960	1955	1960	1955	1960	1955	1960
South Central:								
Kentucky.....	7	7	18	21	21	20	46	48
Tennessee.....	9	9	24	22	38	41	71	72
Alabama.....	4	6	11	16	47	34	62	56
Mississippi.....	3	5	5	6	24	22	32	33
Arkansas.....	2	4	12	13	37	38	51	55
Louisiana.....	2	4	14	20	57	58	73	82
Oklahoma.....	3	3	27	37	39	25	69	65
Texas.....	22	30	75	71	121	119	218	220
Total.....	52	68	186	206	384	357	622	631
Mountain:								
Montana.....	4	5	9	10	19	17	32	32
Idaho.....	5	6	9	11	20	38	34	55
Wyoming.....	1	1	..	2	10	7	11	10
Colorado.....	12	14	12	10	17	20	41	44
New Mexico.....	..	1	2	3	16	22	18	26
Arizona.....	1	1	9	9	3	7	13	17
Utah.....	4	6	10	8	16	12	30	26
Nevada.....	2	2	..	..	4	3	6	5
Total.....	29	36	51	53	105	126	185	215
Pacific:								
Washington.....	13	15	19	17	56	41	88	73
Oregon.....	9	9	21	13	33	34	63	56
California.....	56	59	53	48	22	11	131	118
Total.....	78	83	93	78	111	86	282	247
United States total...	455	530	952	902	1,810	1,712	3,217	3,144

* Includes all plants with an output of 300,000 pounds or more live weight annually.

† New England includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. The District of Columbia is included in Delaware and Maryland.

‡ Other commercial are nonfederally-inspected plants.

Source: U. S. Department of Agriculture, Number of Livestock Slaughter Plants, March 1, 1960, Washington, D. C., 1960, p. 5.

to 1959, the greatest increase being in medium-sized plants. This region was one of two that slaughtered more cattle and calves in 1959 than in 1955—this in the face of decline in United States slaughter of cattle and calves between those years. This upward trend in slaughter, both relative and absolute, is likely to continue. In view of the large numbers of cattle produced there, if cattle feeding continues to rise in the region, it has the greatest potential growth in slaughter of any in the United States. Moreover, Idaho, Colorado, New Mexico, and Arizona should continue to lead the region in growth.

California

Most noticeable of the changes in the California meat-packing industry is the decline in number of packers in the state, particularly in San Francisco and to some extent in Los Angeles. The number of major meat packers and processors in California was 107 in 1949, 122 in 1954, and 118 in 1960. The movement of packing plants from San Francisco and Los Angeles to outlying areas has been partly the result of increased property values where the plants have been situated.

San Francisco, Santa Clara, and San Diego have had decreases in number of packing plants. Los Angeles, Alameda, and Fresno counties are among those experiencing an increase in the number of plants up to 1954 and a decrease since then. The number of packing plants in Napa and San Bernardino counties increased. The number in other areas has remained about the same. In 1960, there were only 91 commercial packers in the state—most of those specializing in slaughter of cattle and calves.

In the United States as a whole, most of the plants are located around the larger metropolitan areas, although this concentration is gradually changing. Los Angeles follows this tendency, but with

the advent of super highways San Francisco and the Bay Area now obtain much of their meat from the Sacramento-San Joaquin Valley and some from packers in the coastal range valleys.

Reflecting the decrease in the number of slaughtering plants, the total number of employees also declined from 10,773 to 8,917 between 1954 and 1958 (table 10).

As the number of slaughtering-plant employees declined, the number employed in California as compared with the United States also declined. Even though fewer men were employed, payrolls were larger in 1958 than in 1954.

The West Coast industry is in a state of flux. It appears to be declining in Oregon and Washington as competition increases from mountain states' slaughterers. California packers are subjected to the same out-of-state competition, which is likely to have an important effect on their industry in coming years.

Concentration

The meat-packing industry has become less concentrated in recent years, and the downward trend appears to be continuing. National packers' share of sales declined from 61 per cent in 1955 to 53 per cent in 1959. However, the large firms appear to be retaining a larger proportion of hog and lamb slaughter than of cattle and calf slaughter. Federal-graded beef featured by chain stores and others has put local and regional packers on an equal footing with the national packers in the distribution of beef.

Specialization

In the aggregate there was very little change in specialization by species by United States meat packers between 1955 and 1960. There was a large shift by federally-inspected packers from the slaughter of all three species to specialization in

Table 10. General Operating Statistics of California Meat Packers Compared With United States Meat Packers, 1954 and 1958*

Item	California		United States		Calif. as per cent of U. S.	
	1954	1958	1954	1958	1954	1958
Slaughtering establishments:						
Total number	122	n.a.†	2,367	n.a.†	5.2	n.a.†
20 or more employees . . .	77	75	933	1,030	8.3	7.3
All employees:						
Number of employees . . .	10,773	8,917	220,194	203,887	4.9	4.4
Payroll (thousands of dollars)	52,209	54,659	942,970	1,081,532	5.5	5.1
Production workers:						
Number of workers	7,736	6,428	167,815	153,294	4.6	4.2
Man hours (thousands) . .	16,327	13,563	354,779	316,243	4.6	4.3
Wages (thousands of dollars)	35,365	36,946	687,878	778,341	5.1	4.7
Value added by manufacture (thousands of dollars) . . .	80,139	93,159	1,394,486	1,690,329	5.7	5.5
Cost of materials (thousands of dollars) . . .	614,501	n.a.†	8,511,201	n.a.†	7.2	n.a.†
Value of shipments (thousands of dollars) . . .	694,640	817,321	9,905,687	12,012,437	7.0	6.8
Capital expenditures (thousands of dollars) . . .	4,211	2,639	64,976	64,710	6.5	4.1

* For similar information on meat processing, see microfilmed Statistical Supplement (see inside front cover).

† Not available.

Source: Census of Manufactures.

cattle. Most of the packers specializing in cattle slaughter are located in the north Atlantic and east north central states. There was little change in specialization by slaughterers on the Pacific Coast. California slaughterers, however, are very specialized—about 75 per cent slaughter only cattle and calves.

Capital Investment

Between 1950 and 1957, the amount of capital expenditures in the meat-products industry increased almost \$27 million. Of these expenditures, about one third was invested in new structures and

additions to plants and two thirds in new machinery and equipment. Meat slaughterers accounted for the largest portion of capital expenditures by the meat industry—\$89.9 million out of a total \$91.7 million in 1956. Packers apparently expect to continue a high level of capital expansion and improvement. Regional, sectional, and local packers plan to make proportionately greater investments in plant and equipment than do national packers.

While capital expenditures by California packers in total fell from \$4.2 million in 1954 to \$2.6 million in 1958, in many instances they are going ahead

with substantial reorganization and improvement.

California processing plants, on the other hand, had an increase in value of shipments and capital expenditures greater than that of United States processors. Value of shipments rose from \$147.5 in 1954 to \$224.7 in 1958.

Integration

In the meat-packing industry, integration generally means the linking of different stages of production and marketing by contract or other form of agreement, rather than having units in the various production levels under the control of one organization.

Integration has been encouraged by several factors: (1) The livestock production process has become more of a science in recent years, and requires more specialized management. (2) Specification buying of meat by chain stores has encouraged livestock producers to attempt to supply animals of specific form and quality according to predetermined time schedules. (3) Packers and feedlot operators have become interested in attempting to even out the flow of livestock to market, thereby reducing seasonal fluctuations. This is of particular importance to pork packers, and accounts for their interest in multiple farrowing schemes. (4) Formula feed production has grown in recent years, partly as a result of government storage programs for grain. (5) The growth of large-scale farming and higher capital requirements have tended to promote integration.

Growth of large commercial feedlots has been the major integration development in the cattle industry, particularly in the west, where it is more difficult for small operations to assemble feed. Also, in the west, feedlots are commonly located next to sugar beet plants or cottonseed oil mills that provide a ready source of cheap cattle feed.

Studies indicate that a substantial

amount of feeding has been done by California packers. In 1956, 20 of the 25 packers contacted in the Los Angeles area were feeding cattle. A 1958 survey showed California to have taken the lead in packer feeding of livestock either by contract or in their own yards.

Integration by livestock producers and packers is likely to continue, but not to the levels of the poultry industry, and integration contracts will probably appear in increasing numbers.

Cost Structure

Total sales of the meat-packing industry have risen in the last 13 years, but livestock costs have declined. In the first half of the period 1947 to 1959, raw material costs represented about 80 per cent of total sales, but in the latter half they were closer to 70 per cent. This improvement in gross margin, however, has not been reflected in net earnings. Also, real earnings were lower in 1958 than in 1947-1949.

While the meat-packing industry has long been noted for its low earnings relative to sales and investment, many packers obtain earnings comparable to those obtained in other industries. In most years, regional, sectional, and local packers have achieved higher returns than national packers. In every year, some packers obtain over 20 per cent return on total assets. Therefore, the industry itself is *not necessarily* a low-return industry.

The technological nature and cost structure of an industry determine in large part the impact on the industry of changes in the factor markets. The cost structure of meat packers is such that variations in cost elements are likely to have substantial differential effects only where uncertainty exists to a high degree and expectations vary.

Livestock and labor costs are the two most important elements of cost. Thus, packers have a high variable-cost structure—although this is constrained some-

what by union contracts. Packers can vary costs substantially by varying the volume of slaughter. This type of cost structure suggests that judicious coördination of livestock procurement and meat distribution has the most marked effect on operating returns of the slaughtering plant. Slaughtering costs are not so rigid as would appear from packer pronouncements, and volume should not be an overriding factor.

Meat packers face a competitive market for livestock in which substantial changes may occur in a short period. Thus, the largest single element in the cost structure is a highly volatile and uncertain element, the characteristics of which promote a great deal of variation in expectations among competitors. *Actual* shifts in livestock supplies and prices probably affect packers of all sizes uniformly in that the changes, except for geographical differences, occur at about the same time and in the same magnitude for all packers. However, because of the uncertainty involved, and because of variations in personal characteristics of packers, packer expectations will not be uniform.

Changes in labor costs and supply are much less than those for livestock. Built-in rigidity in labor as a productive factor has been accomplished by union activities. Changes in labor rates and supply of labor occur rather slowly and tend to occur at about the same time for most packers. Moreover, there is little uncertainty as to this cost element and changes that may take place in it. Thus, the im-

pact of changes in labor rates tends to be uniform among all packers. The efficiency and quality of labor may vary among packers, but otherwise this element of cost appears to affect all sizes and types of packers uniformly.

Technology

Less change in technology has taken place in the meat-packing industry than in most other industries. The industry has become more mechanized in recent years, but in large part still operates with methods and techniques of 25 or more years ago. It has, however, shown definite interest in improving the technical characteristics of livestock and in improving methods of grading livestock. Genetic experiments and investigation of new grading methods continue and are likely to result in substantial benefits for all packers.

The only major change in slaughtering has been conversion to continuous on-the-rail cattle slaughter. At the same time, new equipment has been installed by most packers, and many changes have been made in plant operations.

Many more changes have been made in processing meat than in the slaughter of livestock. Essentially, processing plants have switched from batch to continuous-flow production of many meat products. Automation has made greater strides in meat processing than in any other area of the meat industry. Also, freeze-drying and frozen meats are becoming increasingly important.

CALIFORNIA OUTLOOK

Like other meat packers, those in California operate in an environment of uncertainty, both in the markets for meat and livestock and in changing economic conditions affecting their segment of the industry. In recent years substantial changes in products, methods of distribution, location, and other factors have permeated the whole industry. In view of the uncertainty involved and the changes occurring, what is the prospect for the California meat-packing industry?

The prospective demand for meat in California is excellent. The state, with its growing population, its above-national average per capita income, and its preferences for red meats, appears to be one of the outstanding markets for red meats and meat products in the United States. Total consumption of meat is estimated to rise to 3.4 to 3.7 billion pounds in 1965 and to 4.8 to 5.3 billion pounds in 1975. Of course, red meats will continue to face competition from other foods, particularly poultry. On balance, however, California packers can expect a continued good market for better grades of fresh meat and convenience meats. Beef will probably continue to be the single most important meat consumed in the state, with total consumption rising to 1.8 to 2.1 billion pounds in 1965 and 2.9 to 3.1 billion pounds in 1975.

Prospects for by-products do not appear to be as good as those for meat and meat products. As in other parts of the country, California meat packers are likely to continue to experience difficulties in disposing of inedible by-products. Competition from other products, particularly synthetics, is expected to have a depressing effect on this market.

While the market for meat is growing, the number of California packers is declining and is likely to continue to do so. More than two thirds of the packers in the state have specialized in slaughtering

cattle and calves—however, half of these are very small, and slaughter either dairy cattle or for their own retail account. Thus, the industry supplying the bulk of California's meat is much smaller than would first appear.

As the number of packers declines, the remaining will get larger. Economies of scale appear to exist in the industry, but available evidence indicates that an efficient meat-packing plant still represents only a small proportion of total industry capacity. Thus, the most economical plant is much smaller in the meat-packing industry than in other industries. If, however, economies do exist, many of the smaller or medium-sized packers will continue to increase in size. It is obvious that many of them are expanding slaughtering capacity and operations.

California packers can expect labor costs to remain high, and higher than for many other parts of the country. This is consistent with the high level of per capita income in the state. Competition among themselves, as well as from a growing Rocky Mountain packing industry will make it necessary for California packers to use their labor as efficiently as possible. This implies the adoption of new techniques and plant technologies as rapidly as capital resources permit. In this respect, small packers with limited capital may be at a disadvantage. If this is the case, it will contribute to the decline in number of packers in the state.

The supply of livestock in the United States has continued to increase in the last few years and is expected to continue, especially since livestock represents an efficient means of utilizing growing feed resources in various parts of the country. While livestock cycles are likely to continue to occur, the growing base of livestock numbers is expected to have a dampening effect on livestock prices. This is favorable to California packers.

While California packers will continue to face competition among themselves and uncertainty arising out of the buying practices of chain stores, major difficulty appears to lie in prospective shifts in location of major feeding areas and the consequent development of new packing plants adjacent to these areas. The nation's packing industry is moving closer to original livestock-producing areas and feeding areas, and away from consuming regions. California is a major consuming area which will continue to grow. On the other hand, the state is likely to decline as a livestock production and feeding area. Projections of feed grain and livestock production in California for 1975 indicate a decline in the cattle-feeding industry. To maintain present levels of feeding in 1975 would require inshipment of half the feeder cattle and all of the feed grain.

If the livestock industry in California does not grow much beyond present levels, fed livestock necessary to meet the projected consumption of meat and meat products in coming years will have

to come from other states, most likely those in the Rocky Mountain area. The packing industry in that region is already growing; in some places, the number of packers is growing faster than anywhere else in the nation. If a large-scale feedlot industry develops in those states, the packing industry there will continue to expand. Only lower slaughter costs and favorable livestock transport rates, neither of which seems likely, would attract slaughter livestock away from packers close to feedlots. Packers in other regions will no doubt operate plants as efficiently as California packers, and transport rates for livestock are not likely to improve relative to those for meat. Assuming that slaughter and transport costs are not such as to limit inshipments of meat at a competitive price, then California packers will probably experience difficulty in meeting out-of-state competition. The future position of the California meat-packing industry appears to hinge on the changing location of livestock supply, feed, and feeding areas.

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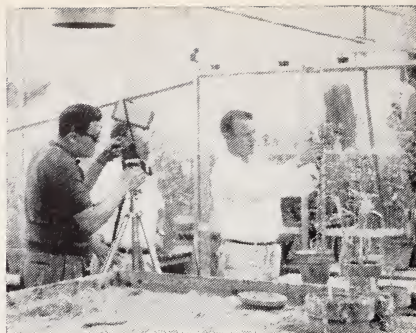
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